The Tale of Mukesh the Monster

Brief Overview:

This lesson introduces the concept of collecting, and analyzing data. It is expected that students will be able to perform an experiment and record the results. They will be able to identify the mode in a set of data. Students will also be able to construct line plots from their data sets and analyze line plots independently from their experiments. Students should be able to perform these skills with up to 20 data points, and with a range less than 10.

NCTM Content Standard:

- Select and use appropriate statistical methods to analyze data by collecting data using observations, surveys, and experiments
- Select and use appropriate statistical methods to analyze data by representing data using tables and graphs such as line plots, bar graphs, and line graphs
- Develop and evaluate inferences and predictions that are based on data by proposing and justifying conclusions and predictions that are based on data and design studies to further investigate the conclusions or predictions.

Grade/Level:

Grade 4

Duration/Length:

3 lessons, for 60 minutes per lesson

Student Outcomes:

Students will:

- Construct a line plot, given a set of data.
- Analyze line plots.
- Modify an existing line plot and discuss how the changes affect the data.
- Find the difference between two modes when given two separate data sets.
- Identify mode given a set of data.

Materials and Resources:

Day 1

- SR Preassessment
- TR Preassessment Answer Key
- SR Exploration Day 1 (cut in two pieces)

    - Enough copies so that half of the class receives one piece and the other half receives the other piece
- Poster board
- SR "The Tale of Mukesh the Monster Day 1"
    - SR Story Part 1
    - SR Accompanying Line Plot
    - SR Data Chart
    - SR Paper Airplane
    - SR Airplane Line Plot
    - SR Enrichment Day 1
- Classroom set of scissors
- Target (a large plate or Frisbee)
- Tape measure (in feet and/or inches)
- TR Answer Key Day 1 Enrichment
- TR Word wall vocabulary words
- TR How to Write a Line Plot Paragraph (this can also be made into a class process chart for students)

Day 2

- Two sample responses from the first day as handouts or overheads
- SR "The Tale of Mukesh the Monster Day 2"
    - SR Accompanying Dice Race
    - SR Accompanying Blank Line Plot
- Pairs of six-sided dice so that each group of students has a set
- SR Enrichment Game Day 2
- Enrichment game tokens (coins or pieces of paper)
- TR How to Write a Line Plot Paragraph (this can also be made into a class process chart for students)
- TR "Word Wall Vocabulary Words"

Day 3

- Two sample line plots from the second day as handouts or overheads
- Masking tape to set up data table
- SR "The Tale of Mukesh the Monster Day 3"
    - Accompanying cube grab
    - Accompanying blank line plot
- Container full of cubes
- SR "Write a Paragraph"
- SR "Summative Assessment"
- SR "The Tale of Mukesh the Monster: the End Day 3"
- TR How to Write a Line Plot Paragraph (this can also be made into a class process chart for students)
- TR "Word Wall Vocabulary Words"

Development/Procedures:

Day 1

Pre-assessment

- Previous to the unit, make sure to review the pre and post assessment to gauge the scope and sequence of instruction your students will need based on your background knowledge of their strengths and weaknesses. This unit can be tailored to specific class' level of knowledge using the differentiation and enrichment activities, along with "if time permits" activities and notes on re-teaching.
- Using student resource "The Tale of Mukesh the Monster Pre-assessment," students will be asked to…
    - Identify the mode in a set of data.
    - Explain what the X's in a line plot represent.
    - What an absence of 'X's means on a line plot.
    - Construct a line plot after being given a set of data.
    - Add data points to an existing graph. Students will then analyze and explain how the new data points changed the mode.

Engagement

- Inform students to not turn over the incoming sheet until instructed and to not let anyone at other tables see their sheet.
- Distribute separated sections of "student resource Exploration Day 1." The paragraph and graph should be given to the class facedown, some with the paragraph, and some with the graph.
- Once all students have a worksheet, ask students to turn their sheet over, explaining that they will be answering questions about the sheet.
- Quickly ask questions to ensure the group with the graph is able to answer more effectively (i.e.: "How many people grew wheat and corn?"). Students should notice that one group is able to answer more quickly than the other. Discuss the activity and ask students why the group with the graph document was able to answer the questions more quickly and efficiently.
- Lead the discussion towards detailing the usefulness of graphs. Discuss some of the important characteristics of graphs: title, axes, intervals, and scale.
- If time permits, students can complete one of the word wall activities contained in teacher resource "Word Wall Vocabulary Words".

Exploration

- Ask students what they know about line plots. As they brainstorm important features and characteristics of line plots, create a mind map on a piece of poster board.

- Lead students to identify that line plots are different from other graphs because they do not have axes. Instead they are represented by categories on a horizontal line.
- Explain to students for the next three days, the class will be investigating line plots. In particular, they will create line plots to track data, and analyze line plots to answer questions.
- Distribute student resource "The Tale of Mukesh the Monster Day 1." Students read the first page, and look at the accompanying table and graph.
- Analyze and discuss the graph. Ask students what the title of the graph is. Use questions like, "What does each x represent," and "What do the 4 x's above Sunday represent?" These questions will guide students to understand the important features of a line plot: title, intervals, labels, scale, and a horizontal line.
- Guide students to recreate the graph. Model for students how to organize data from the story in sequential order, not leaving out or repeating data. Students must be instructed that first they set up their horizontal line, and title. Then they determine an appropriate scale for the graph, and use effective intervals with which to display the data. Finally, students graph the data by crossing out each point immediately after they place it on the graph.
- Briefly model for students how to identify the mode as the data point(s) which appear most often. Discuss the information offered by the mode.
- Model for students how to define and identify clusters and gaps. Discuss these characteristics, if present, on your graph.

Explanation

- Direct students to continue reading the story found below the line plot.
- Explain to students that in order to choose a pilot and defeat the monster, students must be divided into groups of three. On each day, one member of the group will complete the experiment as the other two measure and record data. Students will alternate roles each day.
- Tell students that they will be gathering data on how close the villagers were able to fly their planes to the target by flying paper airplanes towards a target.
- Model for students how to construct a paper airplane. Cut out the rectangle in student resource "Paper Airplane Foldable." Fold along line 1, and then fold along line 2a and line 2b. Finally, fold along line 3a and line 3b.
- Place a target on the ground. Throw a constructed paper airplane in the air near the target.
- Direct student attention to student resource "Target Contest."
- Measure the distance from the tip of the paper airplane to the target to the nearest foot and record the data in a chart.
- Ask for volunteer(s) to repeat the process again.
- If time permits, discuss with students how to use the data to write a "line plot paragraph" (using the steps outlined in teacher resource "Write a Paragraph"). Review important key words with students (cluster, gaps, mode, etc.)

Application

- Direct student attention to student resource "Paper Airplane Foldable" and student resource "Airplane Line Plot" to the students.
- Have students construct model airplanes in SR airplane.
- With partners, each student throws the airplane ten times at the target as the partners measure and record.
- Take anecdotal notes as you observe students completing this exercise.
- Discuss with students the meaning of their data. As a group, look at each team's data and lead them to help you decide which student will serve as the best guide (has the lowest mode).
- If time permits, allow students to practice writing a paragraph describing their line plot using the steps as outlined by TR "Write a Paragraph".

Differentiation

Re-teach
Lead a small group. Ask students to graph their data, explicitly teaching and instructing students on the important features to include (title, key, etc.). Make sure the horizontal line is present and labeled and that the scale is present. Allow the small group to title their own graphs.

Enrich
Ask students to graph their data independently. Encourage students to evaluate a partner's graph and to decide who consistently flew their airplane closest to the target. They will need to identify the student with the lowest mode. Distribute student resource "Enrichment Day 1" to early finishers.

Assessment (Ongoing formative assessment for Day 1)
Using the data from the airplane activity, students will…

- Construct line plots.
- Analyze and discuss line plots and data.
- Early finishers will complete the SR Enrichment Day1 activity.
- Discuss questions at the bottom of the line plot with students.
- Student paragraphs describing line plot data (*if applicable)

Day 2

Engagement

- Give students two sets of data from Day 1. This information represents two persons' results from the airplane game. It should be presented in line plot form.
- Identify the characteristics of a good line plot: title, intervals, labels, a horizontal line, and scale. The intervals and scale should be completely and clearly displayed with no omissions. The scale is

dependent upon the how many times your mode is shown in the data set.

- Question students in order to determine a possible way to determine the typical distance of each player for the airplane game. Lead them to identify the mode of each set of data.
- Using the mode from the data, have students determine which player would be best suited as the pilot for the monster hunt. Lead students to identify the best pilot for the monster hunt as the student whose mode is the least distance from the target and discuss.
- If time permits, students can complete one of the word wall activities contained in teacher resource "Word Wall Vocabulary Words".

Exploration

- Distribute student resource "The Tale of Mukesh the Monster Day 2."
- Read the second part of the story seeking a team member who is the fastest.
- In order to select the member who is the fastest, they will need to find the person who moves the fastest, or who has the LEAST TIME.
- Ask students, "If one person runs one mile in 7 minutes, and another runs one mile in 8 minutes, who is faster?" Continue questioning students until they agree that the runner with the least time is the fastest.

Explanation

- Use the second page of student resource "The Tale of Mukesh Day 2 Data Chart."
- Direct student attention to the section titled, "Dice Race."
- Explain that students will roll two dice, add the numbers, and write the sum next to Roll 1 and so on until students have rolled dice ten times.
- Complete a model chart for students.
- Ask student volunteers to help you write your data in order from least to greatest. This will allow them to effectively create a line plot.
- Demonstrate how to design a line plot suitable to represent your data. Ask volunteers what the first step is when creating a line plot, drawing a horizontal line. Ask new volunteers to determine the next steps, finding a title, labeling numbers 2-12 on the horizontal line, writing a key. Briefly discuss the characteristics of the graph.
- If time permits, discuss with students how to use the data to write a "line plot paragraph" (using the steps outlined in teacher resource "Write a Paragraph"). Review important key words with students (cluster, gaps, mode, etc.)

Application

- Direct class attention to student resource "The Tale of Mukesh the Monster Blank Line Plot."
- Demonstrate the transfer of data from the tables to a line plot. Explain the features of a line plot that must be included: title, a horizontal line, intervals, labels, and scale.

- Make sure that students understand that even if they did not roll a sum of '3', they still must record that data label on their line plots. Even omissions are a form of data!
- Request that students transfer their data to a line plot.
- As students work, circulate and record anecdotal notes.
- If any students need help, move them to a small group to re-teach.
- When students finish graphing the data, ask them to answer questions #1-4 on the line plot.
- If time permits, allow students to practice writing a paragraph describing their line plot using the steps as outlined by teacher resource "Write a Paragraph".

Differentiation

Reteach
Working with a small group, give them your completed data table. Ask students to transfer data from your table to their graphs. Ask questions like, "What labels should we put on the horizontal line," and "Are there any gaps in our line plots?" Make sure the students set up their line plots correctly.

Enrich
Distribute SR "Day 2 Enrichment Game Day 2". Students should begin by placing small tokens on the starting space for each number on the horizontal axis, 2-12. Student pairs roll two dice and find the sum. Students then advance the corresponding token on the game board. For example, if a student rolls a '7,' the token on the number 7 should be advanced one space. Continue rolling numbers until one token is advanced to the last space, the finish line. This is when the game ends. Students should identify certain numbers which are rolled more often than others based on what they observe in the graph. Direct students to draw X's on the game board up to the ending point of each token. This should resemble a line plot. They should identify which numbers will be rolled more frequently and possible reasons why some numbers could be rolled more frequently.

Assessment (Ongoing formative assessment for Day 2)
Using the data from the dice race activity, students will…
- Hand in line plots as a formative assessment.
- Analyze and discuss line plots and data.
- Early finishers will complete the SR Enrichment Day 2 activity.
- Discuss questions at the bottom of the line plot with students.
- Student paragraphs describing line plot data (*if applicable)

Day 3

Engagement
- Hand students two sets of data from Day 2. This information represents two persons' results from the dice game. It should be presented in line plot form.

- Review the characteristics of a good line plot: title, a horizontal line, intervals, labels, and scale. The intervals and scale should be completely and clearly displayed with no omissions.
- Question students in order to determine possible way to determine the fastest runner. Lead them to identify the mode of both sets of data.
- With students, determine which player would be best suited to be the runner for the monster hunt. Students should add up all rolls and choose the runner with the lowest score (is the fastest). Alternatively, students might choose the runner with the lowest (fastest) mode.
- If time permits, students can complete one of the word wall activities contained in teacher resource "Word Wall Vocabulary Words".

Exploration

- Distribute teacher resource "The Tale of Mukesh the Monster Day 3."
- Read the story seeking the last group member.

Explanation

- Direct student attention to a data table that has already been set up. A piece of tape should represent the horizontal line in a line plot, and each stack of cubes will be placed above the line vertically, representing the data in a line plot.
- Model for students the activity for the day. Begin by grabbing cubes out of the manipulatives box. Select a volunteer to count the number of cubes that were pulled in one hand. Ask another volunteer to stack the cubes together and to move them to a class data table.
- Direct class attention to student resource "The Tale of Mukesh the Monster Day 3 Cube Grab."
- Record the number of cubes on the chart. Repeat the process.
- Explain to students that they will do this five times. Then they will select the group of cubes in which they grabbed the most.
- Demonstrate what the students should do by stacking the cubes you grabbed and putting them on a table for class data. This should resemble a line plot without any labels.
- Direct class attention to student resource "The Tale of Mukesh the Monster Day 3 Line Plot."
- Tell students they will be recording all the best data from the class on a line plot. Ask them to identify a good title, axes' names, intervals, labels, and scale. For example, you could ask, "What should be labeled on our x-axes?" They should explain that the number of cubes grabbed should be labeled there, '12, 15, etc.' Ask, "What should each x represent?" They should explain to you that each x will represent one student.
- If time permits, discuss with students how to use the data to write a "line plot paragraph" (using the steps outlined in teacher resource "Write a Paragraph"). Review important key words with students (cluster, gaps, mode, etc.)

Application

- Students should complete the exercise in their groups. One student grabs a handful of cubes five separate times out of the manipulatives box. Other group members should record the number of cubes that were grabbed on each occasion.
- Students stack the blocks from their best grab and place the cubes in a vertical stack above the tape on the data table.
- Students will record class results onto their paper line plot.
- Circulate and take anecdotal notes as students work.
- Ask each student to identify the mode of the class data. Determine the meaning of this data benchmark with the students.
- If time permits, allow students to practice writing a paragraph describing their line plot using the steps as outlined by teacher resource "Write a Paragraph".

Differentiation

Reteach
Regroup students who have not yet mastered the skill and recreate the experiment with only 1 grab of the cubes per student. The small group will then organize their data in sequential order and stack the cubes in the style of a line plot on the table. Explain to students that the cubes represent Xs on a line plot. Ask students, "What could be a possible title of this line plot?" Students should say something to the effect of 'number of cubes grabbed by students' and label this on the tape. Ask students what would be included in the key and label this on the table. Lead them to determine an appropriate interval, labels, and scale. Ask student volunteers to plot points on the line plot. For example, if one student grabbed 18 blocks, ask that student to write an X above 18. Students should then practice transferring the real life line plot to a paper line plot, as they will be asked to do on their assessment.

Enrich
Students should write a paragraph describing their line plot. Give students student resource "Enrichment Paragraph Day 3" to help them guide their responses.

Assessment (Ongoing formative assessment for Day 3)
Using the data from the cube grab activity, students will…
- Hand in line plots as a formative assessment.
- Analyze and discuss line plots and data.
- Early finishers will complete the SR Enrichment Paragraph Day 3 activity.
- Discuss questions at the bottom of the line plot with students.
- Student paragraphs describing line plot data (*if applicable).

Summative Assessment:

Students will use student resource "Summative Assessment" in order to demonstrate that they are able to…
- Interpret and create line plots
- Identify the mode of a set of data.
- Identify a mode given a set of data with 13 numbers.

- Explain what the data contained in a graph means.
    - five ‘x’s above 11 represent five villagers who grew 11 crops
    - three ‘x’s above 8 represent three villagers who grew 8 crops
- Find the difference between the modes of two separate graphs.
- Construct a graph after being given a set of data.
- Select a graph which correctly represents a set of data, showing they are able to…
    - Analyze the information contained in the graphs.
    - Recognize the improper interval.
- Add new data to an existing line plot.
  Explain how the new data affects the mode of the graph.

Students will read “The Tale of Mukesh the Monster: The End Day 3.”

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Name _____

Date _____

The Tale of Mukesh the Monster
Pre-Assessment

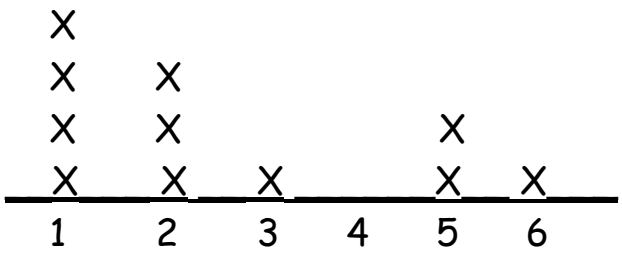
1. This data shows the number of homes blown down by Mukesh the Monster each day one week. What is the mode of the data?

_____

2, 3, 6, 1, 2, 4, 3, 2, 5, 8, 1

2. Based on this line plot, would you say the typical villager grows 3 crops?

_____



Number of Crops Grown by the Villagers

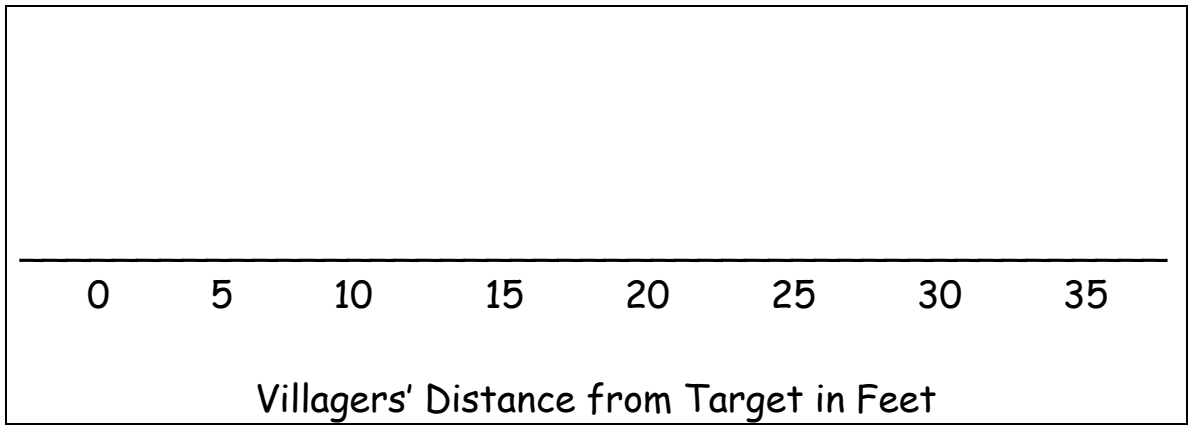
3. Using the line plot above, why are there no X's at 4?

_____

_____

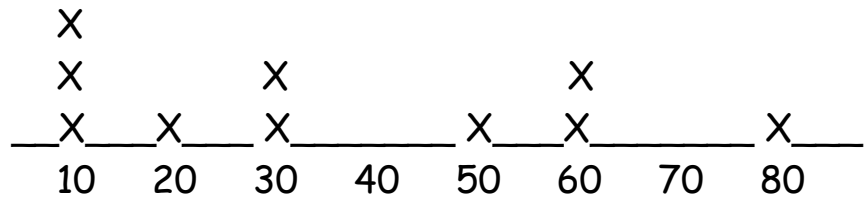
4. The following shows the results of the plane flying contest and how close each villager was able to land next to the target. Use the following data to construct a line plot displaying their results.

30, 5, 10, 20, 20, 10, 15, 10, 5, 25, 25, 35



Brief Constructed Response

Step A: Add the numbers 30, 70, 40, 30 to the following line plot.



Step B: By adding this data did the mode change? Why or why not?

_____

_____

Name _____

Date _____

The Tale of Mukesh the Monster
Pre-Assessment Answer Key

1. This data shows the number of homes blown down by Mukesh the Monster each day one week. What is the mode of the data?

2, 3, 6, 1, 2, 4, 3, 2, 5, 8, 1

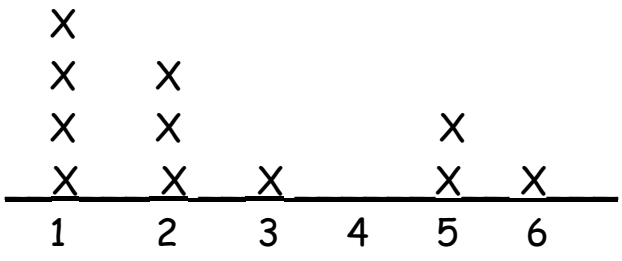
2

(2 is the correct answer because this is the data point which occurs the most times)

2. Based on this line plot, would you say the typical villager grows 3 crops?

no

(3 is not the mode of the data, based on the data the typical villager grows 1 crop)



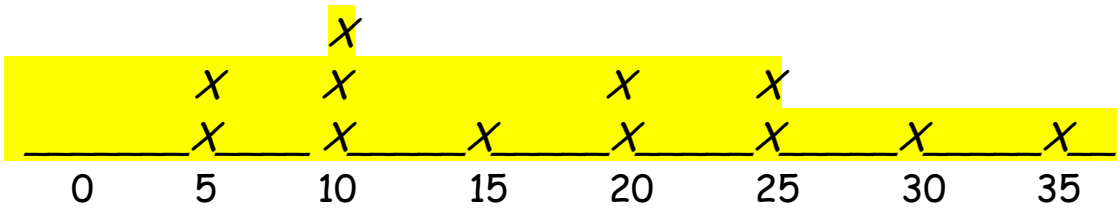
Number of Crops Grown by the Villagers

3. Using the line plot above, why are there no Xs at 4?

Sample Answer: There are no Xs at 4 because none of the villagers grow 4 crops.

4. The following shows the results of the plane flying contest and how close each villager was able to land next to the target. Use the following data to construct a line plot displaying their results.

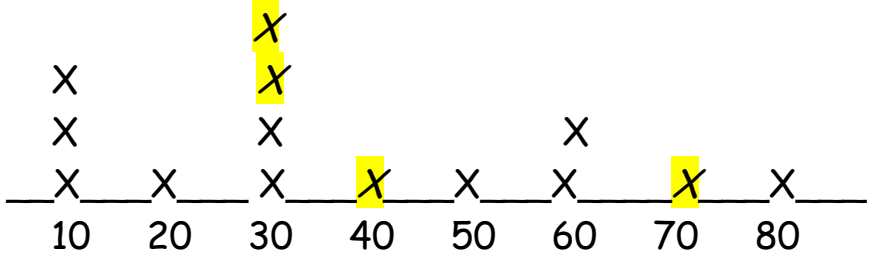
30, 5, 10, 20, 20, 10, 15, 10, 5, 25, 25, 35



Villagers' Distance from Target in Feet

Brief Constructed Response

Step A: Add the numbers 30, 70, 40, 30 to the following line plot.



Villagers' Race Times in Seconds

Step B: By adding this data did the mode change? Why or why not?

Yes, the mode changed from 10 prior to adding the data, to 30 after I added data. Before the data was added three villagers completed the race in 10 seconds which was more than any other race time. After adding the new data four villagers completed the race in 30 seconds, which was more than the original mode.

Exploration Day 1

Once upon a time there was a village named Lowland located at the bottom of a tall mountain. The people living in the village grew many different types of crops. Tom and Jessica grow corn only. Jenny grows wheat and corn. Demetrius, Shalyn, and Tyler grow cotton and wheat. Trevor and Diamond grow only cotton.

CUT HERE ✂

Exploration Day 1

There are eight farmers in Lowland. Below are the farmers and the crops they grew.

Corn	Wheat and Corn	Cotton and Wheat	Cotton
1.Tom	1. Jenny	1. Demetrius	1. Trevor
2. Jessica	2. Shalyn		2. Diamond
			3. Tyler

Word Wall Vocabulary Words

Data

Line Plot

Mode

Title

Axis

Interval

Label

Scale

Key

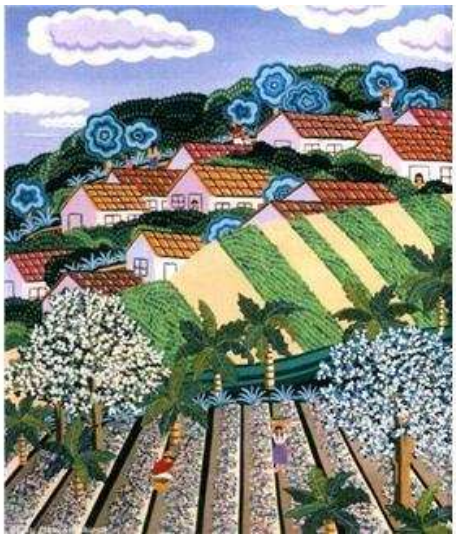
Cluster

Gaps

*Beyond placing these words on the word wall, the teacher can do the following activities with students to reinforce the meaning of the words and help students "own" this vocabulary in their math talk:

1. Ask students to match each word to a blown up line plot and discuss how they relate to the graph.
2. Tape the words up onto the wall and play "I Spy." Divide the students into two groups and ask them to line up in front of the words. Provide the students with the definition of one of the words (without hinting to them which one you referring to). The first team members in each line will race to see who can raise their hand the quickest and provide the correct word.
3. Divide the students into two groups. Write all the vocabulary words twice (one list for each team) on either side of the board. Have students line up in front of their list and provide the first student in line with an eraser. Give students an example of *or* definition for one of the words. Students will raise their hand; the first one to raise their hand and identify the correct vocabulary word will erase the word from their team's list. The first team to erase all their words wins.
4. Divide the students into two groups. Give a word to the students, the first team to be able to both define and provide an example of the word is given the opportunity to "shoot a basket" to double their

points (this can be done with a wadded up piece of paper and trashcan).



The Tale of Mukesh the Monster
Day 1

Once upon a time, in a small farming village named Lowland, there were rumors of a terrible monster living in the nearby mountains. Though none of the villagers had actually seen the monster, the elders in the village passed stories around at night scaring the village children. Over time the monster had come to be named Mukesh, and the villagers were able to farm in peace until one dreadful week in September.

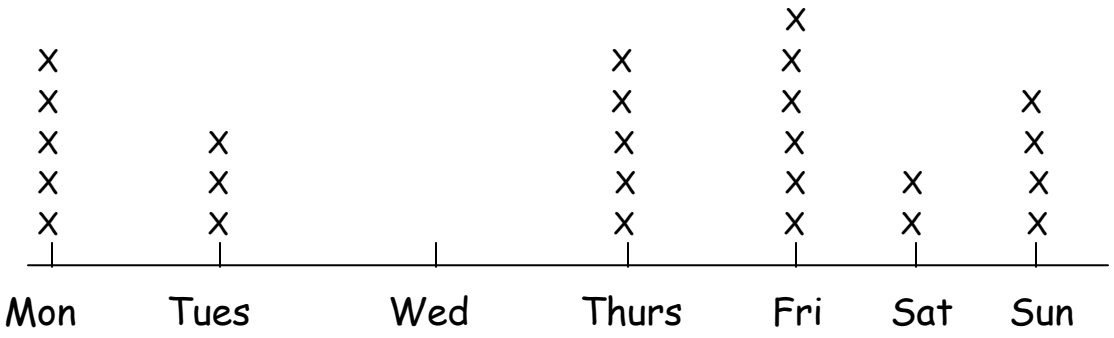
The week started off like any other, but as the villagers were working in the fields a shrieking wind rushed down the mountain and the village was badly damaged. On Monday, 5 houses were blown to the ground. The next day, 3 houses were destroyed by the same howling winds. When the wind quieted Wednesday, the villagers breathed a sigh of relief, yet 5 more houses were demolished on Thursday. The villagers looked suspiciously to the mountain, whispering about Mukesh. Then Friday, 6 houses were torn apart. Only 2 houses fell on Saturday, but on Sunday another 4 houses fell. The village was in ruins.

By the end of the week the villagers were convinced the monster was attacking them from atop the mountain. They met in secret discussing what they could do. Not only were their homes being destroyed but the crops were dying. The monster had to be stopped!

The Tale of Mukesh the Monster

Day of the Week	Number of Homes Destroyed
Monday	5
Tuesday	3
Wednesday	0

Thursday	5
Friday	6
Saturday	2
Sunday	4

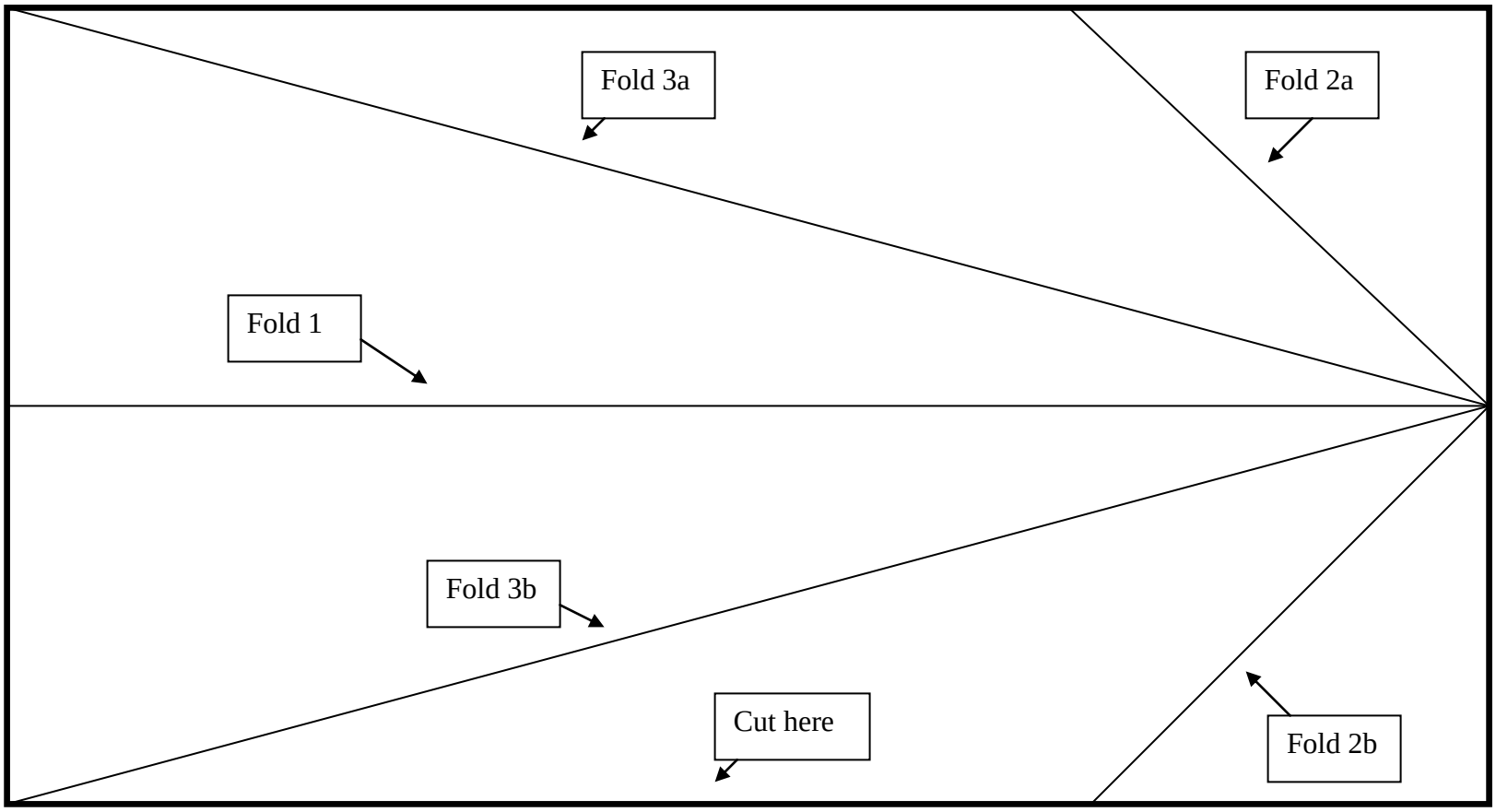


Number of Homes Blown Down in Lowland

The villagers met in one of the last homes that had not been ruined to discuss how they could stop the destruction of Lowland. They decided that they must confront the monster, but a fight broke out over who would be sent up the mountain. All the villagers wanted the chance to stop Mukesh, but some needed to stay behind to protect what was left of Lowland. It was decided that they would hold a series of contests to pick the most capable fighter. The first contest would identify the villager who could best target the monster from a plane.

Target Contest

Flight Number	Distance from Target (feet)
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	



Paper Airplane Foldable

Airplane Line Plot

Keep your Xs the same size!

Remember to include a title!

Discussion:

1. Do you see any clusters in the data?
2. Do you see any gaps in the data?
3. What is our mode? _____
4. Which "target score" would the villagers want their top pick to have?

KEY

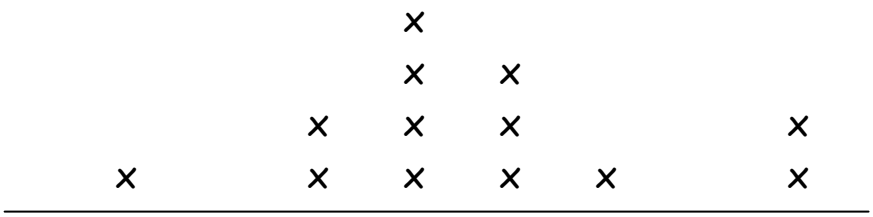
X = _____

Steps to Writing a Paragraph Describing Line Plots

Here are some ideas to direct your thinking.

1. Write a topic sentence describing what your line plot represents. Make sure to mention the title of your graph.
2. Give information about the number of people surveyed, and that number is represented in your graph.
3. Describe the shape of the data. Mention any clusters, gaps, and/or outliers.
4. Tell the largest and smallest values in your data.
5. Describe what information you can draw based upon your data. For example, what was the mode of your data?

Write a Paragraph!



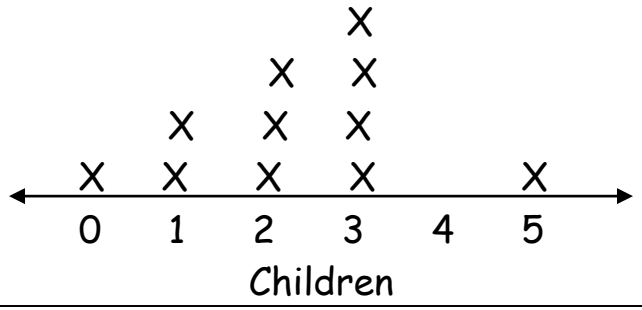
Here are some ideas to direct your thinking.

6. Write a topic sentence describing what your line plot represents. Make sure to mention the title of your graph.
7. Give information about the number of people surveyed, and that number is represented in your graph.
8. Describe the shape of the data. Mention any clusters, gaps, and/or outliers.
9. Tell the largest and smallest values in your data.
10. Describe what information you can draw based upon your data. For example, what was the mode of your data?

Enrichment- Day 1

Number of Children in Each Lowland Family

KEY
X = 1 child



1. How many villagers have 2 or more children? _____

2. What is the most number of children in a Lowland family? _____

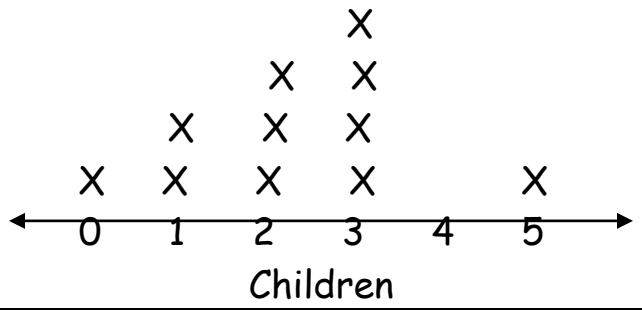
3. How many children does the typical family have? _____

4. How many more villagers have 2 children than 0 children? _____

Enrichment- Day 1 – Answer Key

Number of Children in Each Lowland Family

KEY
X = 1 child



1. How many villagers have 2 or more children? 8

2. What is the most number of children in a Lowland family? 5

3. How many children does the typical family have? 3

4. How many more villagers have 2 children than 0 children? 2

The Tale of Mukesh the Monster
Day 2

The gale winds continued to roll down the mountain throughout the day. No one could rebuild their home or repair their fields, so they continued to plan. Now that the pilot had been picked, the villagers knew they now needed someone who was fast and agile. Since they had no idea how strong or large Mukesh was, the villagers decided it was best to have one person who could get in and out of the fight quickly. To pick this person the villagers set up a race to see who could reach the end of the field most quickly.

The entire village met in a far field which was shielded from the mountain by trees. They did not want to risk the monster viewing their plans and preparing. The villagers who wanted to join the fight lined up and waited for the starting signal. By the end of the race Lowland would be one day closer to stopping the destruction caused by Mukesh.

The Tale of Mukesh the Montser- Day 2

Dice Race

Roll	Sum of Dice
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Now, arrange your data in order from least to greatest, do not leave out repeats!

Dice Race "Times"

The Tale of Mukesh the Monster Day 2 Line Plot

Keep your Xs the same size!

Remember to include a title!

Discussion:

5. Do you see any clusters in the data?
6. Do you see any gaps in the data?
7. What is our mode? _____
8. Which "speed" would the villagers want their top pick to have?

KEY

X = _____

Enrichment Game Day 2

FINISH										
2 START	3	4	5	6	7	8	9	10	11	12

Enrichment Game Day 2

Day 2 Early Finishers

1. Find a partner.
2. Place a marker (penny, eraser, or small piece of paper) on each number at the bottom of the game board.
3. You and your partner are going to roll 2 six-sided dice. Add up the results. If you roll a '5' and a '1', then you should record a '6' as the results of your first roll.
4. If you and your partner roll a '8' on the dice, then advance your token up one space from START.
5. Continue until one number has won.

Question A) Which number do you predict will win?

_____

Question B) After you finish playing the game, which number actually won?

_____

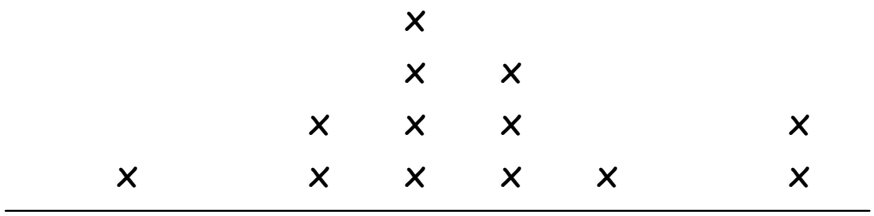
Question C) Why is a '7' rolled more often than a '2' on the dice?

_____

_____

_____

Write a Paragraph!



Here are some ideas to direct your thinking.

1. Write a topic sentence describing what your line plot represents. Make sure to mention the title of your graph.
2. Give information about the number of people surveyed, and that number is represented in your graph.
3. Describe the shape of the data. Mention any clusters, gaps, and/or outliers.
4. Tell the largest and smallest values in your data.
5. Describe what information you can draw based upon your data. For example, what was the mode of your data?

The Tale of Mukesh the Monster
Day 3

There was now a team of two villagers to defeat Mukesh; Simon would be the pilot and Mackenzie would be their runner. The situation was becoming desperate as winds blew parts of their homes across the fields and their animals were forced to hide under remaining trees. They all agreed they still needed one more person to complete the group, someone who would prove their courage and strength in the third and last competition of the week.

The last competition was held at the base of the mountain where rocks had tumbled down the side to rest in large piles. Again, the villagers did not know how large or strong the monster was, so they needed someone who could pick up the most rocks at once to throw. Those still wishing to compete picked up as many rocks as they could hold in one hand and the third day drew to a close.

The Tale of Mukesh the Monster Day 3

Cube Grab

Grab	Number of Cubes
1	
2	
3	
4	
5	

Now, arrange your data in order from least to greatest, do not leave out repeats!

Cube Grab Data

*When finished, stack and connect your cubes from the grab in which you had the most cubes

The Tale of Mukesh the Monster Day 3 Line Plot

Discussion:

9. Do you see any clusters in the data?
10. Do you see any gaps in the data?
11. What is our mode? _____
12. Which "grab" amount would the villagers want their top pick to have?

KEY

X = _____

The Tale of Mukesh the Monster
~ The Fight on the Mountain ~

Simon, the pilot, Mackenzie, the runner, and Sean, the rock thrower, woke up early on the fourth day. The entire village met at the village's crop dusting plane as the sun started to peak over the mountaintop. They were wished good luck and boarded the plane. Simon was able to fly the plane through the thick clouds at the top of the mountain and landed quietly. Sean and Simon covered the plane in branches and leaves to camouflage their escape. They had decided Simon would stay with the plane so they could take off as soon as the job was done.

Mackenzie and Sean set off into the forest towards the sound of the winds. As they got closer to the source, they found it was coming from a large, dark cave. Each time the wind erupted from the cave the trees surrounding the entrance bent over and branches cracked from the trunk. Mackenzie signaled to Sean that she was going to sprint to the front of the cave between winds. The plan was for Sean to start throwing rocks to draw Mukesh out of the cave. In the meantime Mackenzie had attached a vine to either side of the entrance, to trip up Mukesh when he left the cave. After she was finished, she nodded to Sean and he started gathering rocks.

Sean was getting ready to hurl the first load of rocks at the cave's entrance when he heard a peculiar noise. It sounded like a

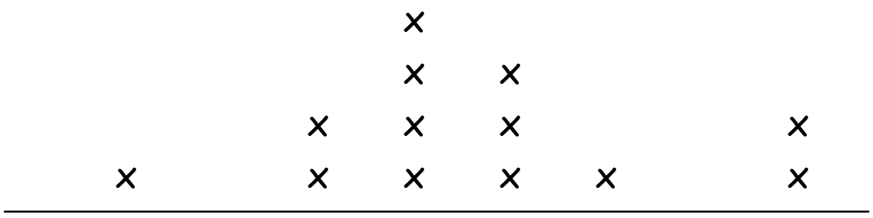
rumbling, "ah, ah, ah" and was immediately followed by a blast of wind. He looked at Mackenzie and could tell she noticed the same strange sound by the perplexed look on her face. They had never noticed this sound in the village. Then they heard the monster moving towards the front of the cave, and Sean instinctively pulled back his arm ready to throw the rocks. When the monster emerged from the cave Sean and Mackenzie could only stare in amazement at what they saw.

Mukesh was actually a pitiful looking dragon whose nose was running and whose eyes were tearing up. The dragon lay down at the entrance of the cave and sighed miserably, sniffling and trying to wipe his eyes. He began to raise his head, and then...he sneezed! Sean and Mackenzie toppled over from the force of the giant sneeze. Sean dropped the rocks and Mackenzie stepped cautiously towards Mukesh. "Are you alright?" Sean asked. Mukesh looked up sharply; he had not noticed the two villagers near his cave. When he saw Sean and Mackenzie meant him no harm, he explained that ever since Lowland had started using planes to dust their crops, he had been terribly sick. They told him of the damage to the village that his sneezing had caused and the dragons eyes overflowed with tears as he apologized over and over again. Sean and Mackenzie promised they would talk to the villagers and convince them to stop using the crop dusters.

The villagers could scarcely believe their story when they returned to the bottom of the mountain, but they all agreed to stop using the dusting material which had caused Mukesh so much trouble. The village was able to rebuild quickly with the help of Mukesh bringing them materials off the mountain. From then on the village of Lowland and the dragon Mukesh lived together in peace happily ever after.

The end...

Write a Paragraph!



Here are some ideas to direct your thinking.

1. Write a topic sentence describing what your line plot represents. Make sure to mention the title of your graph.
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4. Tell the largest and smallest values in your data.
5. Describe what information you can draw based upon your data. For example, what was the mode of your data?

Name _____

Date _____

The Tale of Mukesh the Monster
Summative Assessment

1. This data shows the number of people living in each home in the village. What is the mode of the data?

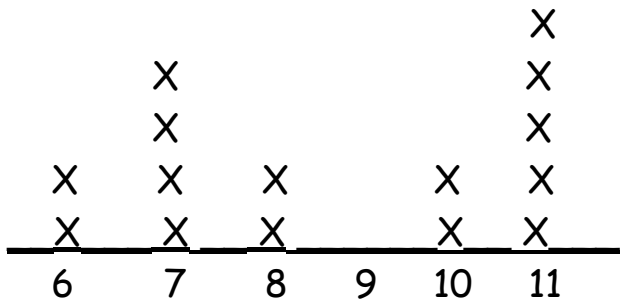
_____

1, 3, 2, 6, 5, 3, 2, 5, 6, 6, 4, 1, 6

2. What do the five Xs above 11 represent?

_____

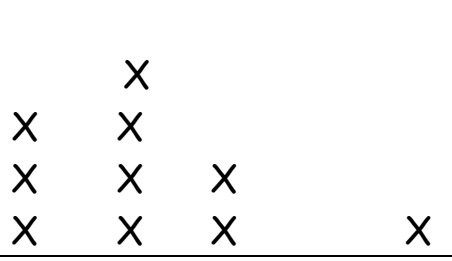
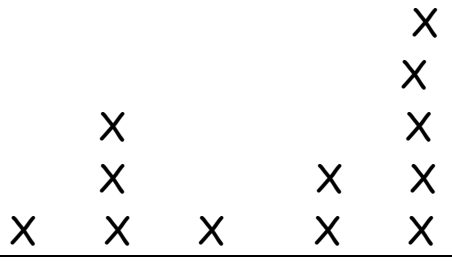
KEY X = 1 crop



Number of Crops Grown by the Villagers

3. What is the difference between the modes of the two line plots below? (Show your work)

KEY
X = 1 crop

Table A	Table B
	

Number of Crops Grown

Number of Crops Grown

4. The following shows the results of the plane flying contest and how close each villager was able to land next to the target. Use the following data to construct a line plot displaying their results.

30, 5, 10, 20, 20, 10, 15, 10, 5, 25, 25, 35

KEY
X = _____

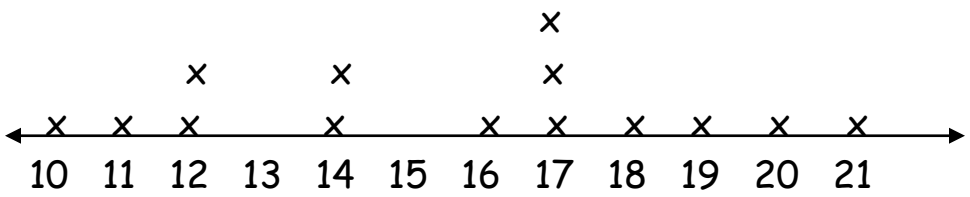
5. Which graph correctly represents the following data?

_____

Villagers' Race Time in Seconds

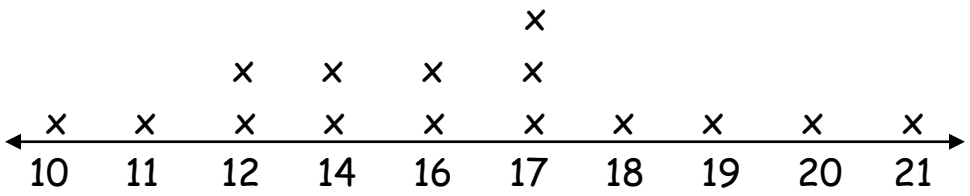
12 14 19 14 17 21 11 16
17 16 17 18 10 20 12

A.



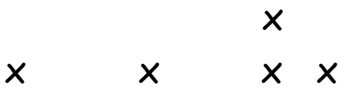
Villagers' Race Time in Seconds

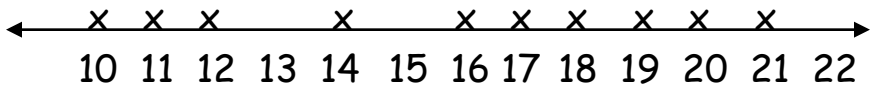
B.



Villagers' Race Time in Seconds

C.

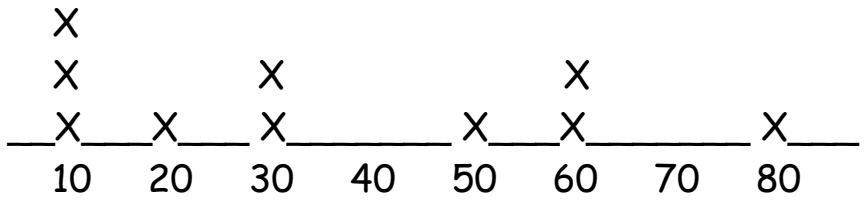




Villagers' Race Time in Seconds

Brief Constructed Response

Step A: Add the numbers 20, 70, 40, 50 to the following line plot.



Villagers' Race Times in Seconds

Step B: By adding this data did the mode change? Why or why not?

For extra credit, write a short paragraph describing the line plot you added to in the BCR:

Name _____

Date _____

The Tale of Mukesh the Monster
Summative Assessment Answer Key

1. This data shows the number of people living in each home in the village. What is the mode of the data?

6

(6 is the correct answer because this is the data point which occurs the most times)

1, 3, 2, 6, 5, 3, 2, 5, 6, 6, 4, 1, 6

2. What do the five Xs above 11 represent?

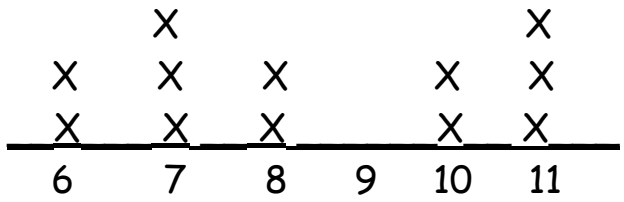
The five Xs represent the five farmers who grew 11 crops.

KEY
X = 1 crop

X

X

X

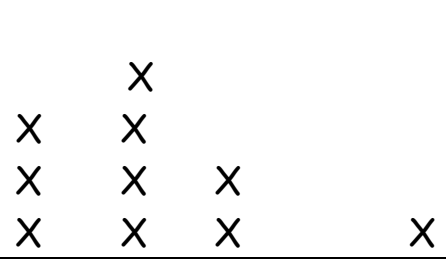
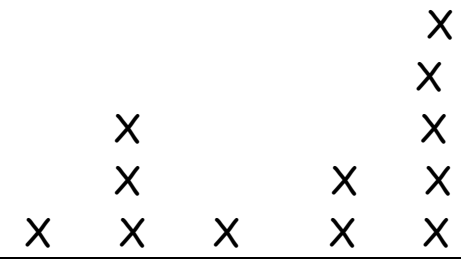


Number of Crops Grown by the Villagers

3. What is the difference between the modes of the two line plots below? (Show your work)

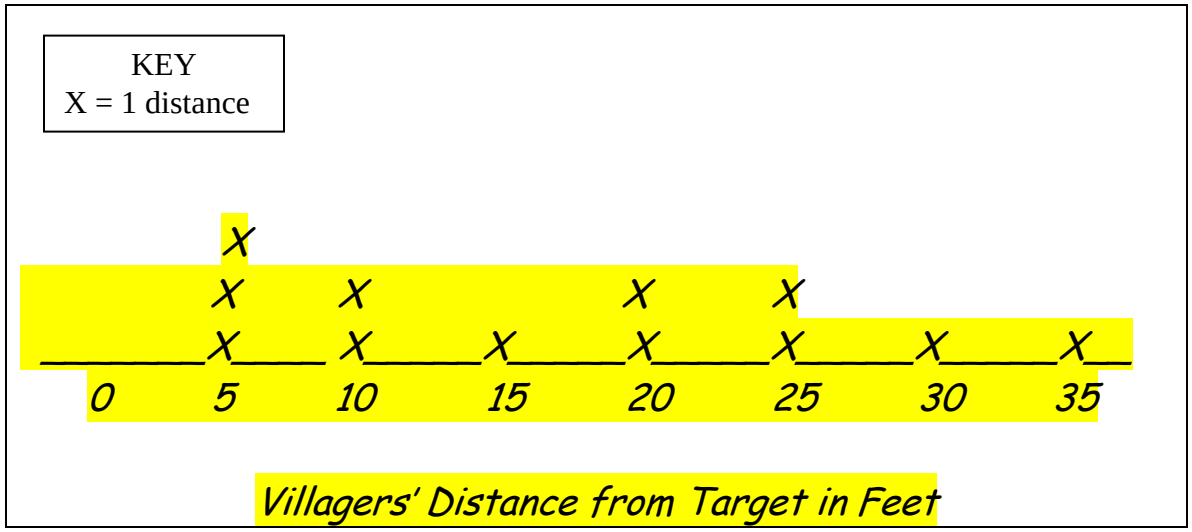
11 - 8 =

KEY
X = 1 crop

Table A	Table B
	

4. The following shows the results of the plane flying contest and how close each villager was able to land next to the target. Use the following data to construct a line plot displaying their results.

30, 5, 10, 20, 20, 10, 15, 10, 5, 25, 25, 35

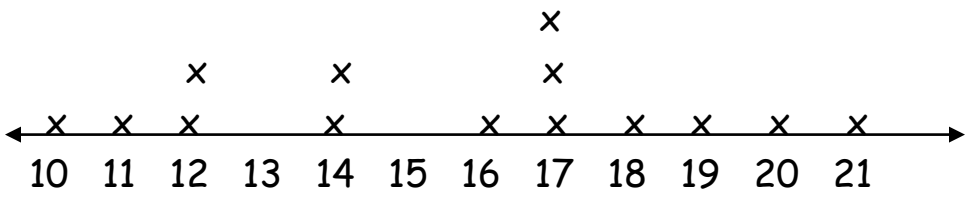


5. Which graph correctly represents the following data?

Villagers' Race Time in Seconds

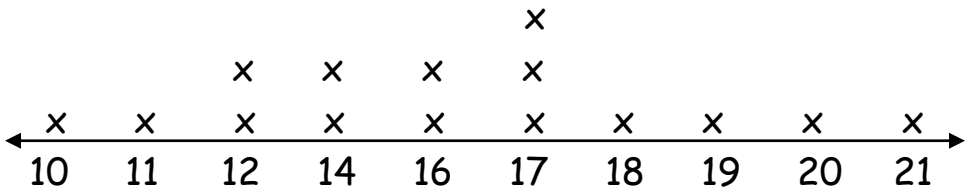
12		14		19		14		17		21		11		16	
	17		16		17		18		10		20		12		

A.



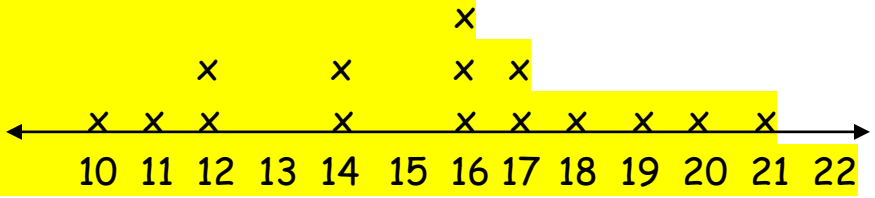
Villagers' Race Time in Seconds

B.



Villagers' Race Time in Seconds

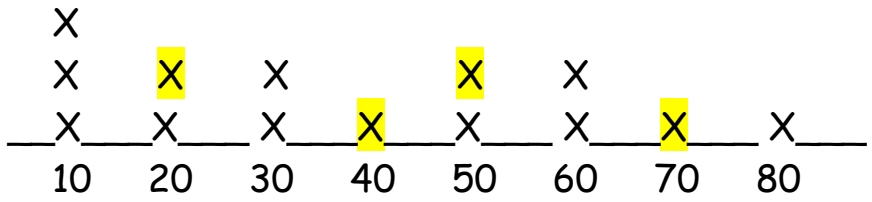
C.



Villagers' Race Time in Seconds

Brief Constructed Response

Step A: Add the numbers 20, 70, 40, 50 to the following line plot.



Villagers' Race Times in Seconds

Step B: By adding this data did the mode change? Why or why not?

No, the mode did not changed because prior to adding the data most villagers' race time was 10 seconds, and after adding the

data most villagers' race time was still 10 seconds.

For extra credit, write a short paragraph describing the line plot you added to in the BCR: (score based on your district's BCR rubric, answers will vary)

The name of this line plot is "Villagers' Race Time in Seconds." The graph describes how many villagers finished at each time interval (10 seconds, 20 seconds, etc.). There are 14 total data points or race times on the graph. The data is spread throughout all times without any gaps. The most villagers ran the race in 10 seconds; the least villagers ran the race in 40, 70, and 80 seconds. Based on the data, there are 3 villagers who have the fastest time who might be best to choose for the team.